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TRANSLATION

METHOD OF OBTAINING IMPACT DEFORMING FORCES BY
MEANS OF ELECTROHYDRAULIC SHOCKS

By

L. A. Yutkin and L. I. Gol'tsova

FOREIGN TECHNOLOGY DIVISION

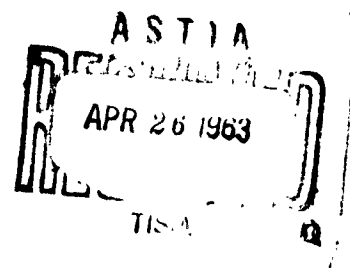


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UNEDITED ROUGH DRAFT TRANSLATION

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BY: L. A. Yutkin and L. I. Gol'tsova

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419284/25, 24 May 1962), 1962, pp 1-3

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METHOD OF OBTAINING IMPACT DEFORMING FORCES BY MEANS OF ELECTROHYDRAULIC SHOCKS

by

L. A. Yutkin and L. I. Gol'tsova

There are known methods of obtaining impact deforming forces by means of electrohydraulic shocks effected in a liquid medium.

For accomplishing forging, stamping, lamination, beading, riveting, cleaning, forcing in, bending, breaking, cutting, and other kinds of processing of materials impact deforming forces, in accordance with the proposed method, are obtained by means of electrohydraulic shocks producible in a cylinder filled with a liquid, or a chamber with a piston or membrane, taking up the force of shocks and transmitting them directly or through a suitable instrument connected with them to an object to be deformed, and the reverse displacement of the piston or membrane is accomplished by atmospheric pressure on slamming the cavitation void.

The electrohydraulic shocks are produced by a known method--as the result of pulse discharges on electrodes inside the volume of any current-conducting or nonconducting liquid.

The regulation of the force or hardness of the shocks is accomplished by means of change in the parameters of the pulses with a given length of the spark, or distance of the electrodes from the piston or membrane, which

changes the physical property of the liquid, for example, its elasticity.

For replenishment of losses of working fluid or constant replacing of it with simultaneous removal of traces of gas or vapor formed the input and output channels of the fluid are made geniculate.

In Fig. 1 there is sketched the device for accomplishing the proposed method; in Fig. 2 the mechanism of the wedge support.

In the guides 1 of the base 2 the cylinder 3 moves freely under the action of its own weight, with the piston 4 lying on the processed part 5. The raising and the lowering of the cylinder with the piston on the part are accomplished by the usual means, manual or mechanical.

In the cylinder ^{above} the piston there is created a working cavity 6 filled with a fluid. Through the walls of the cylinder into the working cavity there are introduced the electrodes 7. By the geniculate channel 8 the working cavity is connected with the reservoir 9, in which there is the fluid poured into the reservoir through the funnel 10.

For eliminating the reactive losses of energy of the shocks there is used a device set over the body of the ^{instrument} that is designed in the form of a wedge mechanism consisting of two flat wedges 11 and 12, the movement of which is controlled by the hydraulic ^{cylinders} 13 and 14, built into the base. In proportion to the deformation of the part the wedges automatically shift creating a constant support of the piston.

The method described can find application in the machine-building industry and other branches of engineering.

O b j e c t o f t h e I n v e n t i o n

1. A method of obtaining impact deforming forces by means of electro-hydraulic shocks produced in a fluid medium, which is distinguished by the fact that for the purpose of accomplishing forging, stamping, lamination,

bending, riveting, cleaning, forcing in, bending, breaking, cutting, and other kinds of processing of materials. electrohydraulic shocks are produced in a cylinder or chamber with a piston or membrane (or in a series of cylinders or chambers oriented in the necessary way), taking up the force of the shocks and transmitting them, directly, or through a suitable instrument connected with them, to the object being processed, and the reverse shifting of the piston or membrane is accomplished by atmospheric pressure on slamming the cavitation void.

2. A method in accordance with 1, distinguished by the fact that, for the purpose of regulating the force or hardness of the shock, one changes the parameters of the pulse at a given length of the spark or distance of the electrodes from the piston or membrane, which changes the physical properties of the fluid, for example, its elasticity.

3. A method in accordance with 1 and 2, distinguished by the fact that for the purpose of replenishing the losses in fluid or constant replacing of it with simultaneous elimination of gas or vapor formed the channels of input and output of the fluid are designed geniculate.

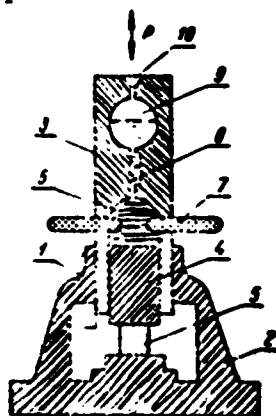


Fig. 1

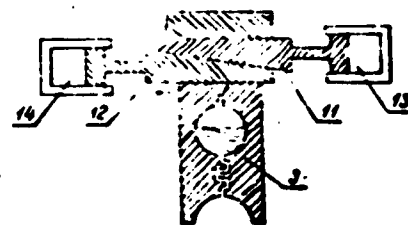


Fig. 2

Composer of description: S. Ye. Vagin.

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